401 KAR 61:005. General provisions.

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
Department for Environmental Protection
Division for Air Quality

Relates to: KRS Chapter 224
Pursuant to: KRS 13.082, 224.033
Necessity and Function: KRS 224.033 requires the Department for Natural Resources and Environmental Protection to prescribe regulations for the prevention, abatement, and control of air pollution. This regulation is to provide for the establishment of monitoring requirements, performance testing requirements, and other general provisions as related to existing sources.

Section 1. Applicability.
The provisions of this chapter shall apply to the owner or operator of any existing source for which a standard of performance has been promulgated under this chapter.

Section 2. Performance Test.

(1) On or before the completion of a control plan at an affected facility and at such other times as may be required by the department, the owner or operator of an affected facility, except for those affected facilities specified below, shall conduct performance test(s) according to 401 KAR 50:045 and shall furnish the department a written report of the results of such performance test(s).
   (a) Process operation with a process weight rate of less than 100 tons per hour;

   (b) Indirect heat exchangers of less than 250 million BTU heat input;

   (c) Incinerator with a charging rate of forty-five (45) metric tons per day (fifty (50) tons/day) or less;

   (d) Affected facilities specified in: 401 KAR 61:040, 401 KAR 61:045, 401 KAR 61:050, 401 KAR 61:056, 401 KAR 61:060, 401 KAR 61:085, 401 KAR 61:090, 401 KAR 61:095, 401 KAR 61:100, 401 KAR 61:105, 401 KAR 61:110, 401 KAR 61:120, 401 KAR 61:122, 401 KAR 61:124, 401 KAR 61:125, 401 KAR 61:130, 401 KAR 61:132, 401 KAR 61:135, 401 KAR 61:137, 401 KAR 61:150, 401 KAR 61:155, 401 KAR 61:160.

(2) The department may require the owner or operator of any affected facility including those specified in subsection (1) of this section to conduct performance test(s) according to 401 KAR 50:045 and furnish a written report of the results of such performance test(s).

Section 3. Emission Monitoring.
This section sets forth the minimum requirements for continuous emission monitoring, recording, and reporting for source categories which are set forth. It includes the performance specifications for accuracy, reliability, and durability of acceptable monitoring systems and techniques to convert emission data to units of applicable emission standards.

(1) The owner or operator of a source in a category listed below shall:
   (a) Install, calibrate, operate and maintain all monitoring equipment necessary for continuously monitoring the pollutants specified in this section for the applicable source category;

   (b) Complete the installation and performance tests of such equipment and begin monitoring and recording within eighteen (18) months from June 29, 1979, except as provided in paragraph (c) of this

subsection; and

(c) For continuous emission monitoring systems for which there are no performance specifications under Appendix B of 40 CFR 60, filed by reference in 401 KAR 50:015, as of June 29, 1979, complete the installation and performance tests of such equipment and begin monitoring and recording within eighteen (18) months of promulgation of the applicable performance specifications under Appendix B of 40 CFR 60.

(2) The source categories and the respective monitoring requirements are listed below.

(a) Indirect heat exchangers, as specified in subsection (6)(a) of this section shall be monitored for opacity, sulfur dioxide emissions, and oxygen or carbon dioxide.

(b) Sulfuric acid plants, as specified in subsection (6)(b) of this section shall be monitored for sulfur dioxide emissions.

(c) Nitric acid plants as specified in subsection (6)(c) of this section shall be monitored for nitrogen oxides emissions.

(d) Petroleum refinery affected facilities as specified in subsection (6)(d) of this section shall be monitored as specified in subsection (6)(d) of this section.

(e) Incinerators, as specified in subsection (6)(f) of this section, shall be monitored for opacity.

(f) Control devices, as specified in subsection (6)(f) of this section, shall be monitored for opacity.

(3) Exemption. Sources which are schedules for retirement within five (5) years after June 29, 1979 are exempt from the requirements of this section, provided that adequate evidence and guarantees are provided that clearly show that the source will cease operating on or before that date.

(4) Extensions. Reasonable extensions of the time provided for installation of monitors may be allowed for sources unable to meet the time-frame prescribed in subsection (1)(b) of this section, provided the owner or operator of such facility demonstrates that good faith efforts have been made to obtain and install such devices within such prescribed time-frame.

(5) Monitoring systems malfunctions. The department may provide a temporary exemption from the monitoring and reporting requirements of this section during any period of monitoring system malfunction, provided that the source owner or operator shows, to the department's satisfaction, that the malfunction was unavoidable and is being repaired as expeditiously as practicable.

(6) Monitoring requirements:

(a) Indirect heat exchangers. Each indirect heat exchanger, except as provided in the following subparagraphs, with an annual average capacity factor of greater than thirty (30) percent as demonstrated to the department by the owner or operator, shall conform with the following monitoring requirements when such facility is subject to an emission standard for the pollutant in question. (Annual average capacity factor means the ratio of the actual annual heat input to the potential annual heat input based in rated capacity.)

1. A continuous monitoring system for the measurement of opacity which meets the appropriate performance specification as specified in subsection (7) of this section shall be installed, calibrated, maintained, and operated in accordance . with the procedures of this subsection by the owner or operator of any such indirect heat exchanger of greater than 250 million BTU per heat input except where: gaseous fuel is the only fuel burned, or oil or a mixture of gas and oil are the only fuels burned and the source is able to comply without utilization of particulate matter collection equipment, and where the source has never been found, through any administrative or judicial proceedings, to be in violation of any visible emission standard.

2. A continuous monitoring system for the measurement of sulfur dioxide which meets the appropriate performance specifications as specified in subsection (7) of this section shall be installed, calibrated, maintained, and operated on any indirect heat exchangers (except where natural gas or wood waste is burned) of greater than 250 million BTU per hour heat input.

3. A continuous monitoring system for the measurement of the percent oxygen or carbon dioxide which meets the appropriate performance specifications as specified in subsection (7) of this section shall be installed, calibrated,operated, and maintained on indirect heat exchangers where measurements of oxygen or carbon dioxide in the flue gas are required to convert either sulfur dioxide or nitrogen oxides continuous emission monitoring data, or both, to units of the emission standard.

(b) Sulfuric acid plants. For the purposes of this regulation, "sulfuric acid plant" means any facility producing sulfuric acid by the contact process by burning elemental sulfur, alkylation acid, hydrogen sulfide, or acid sludge, but does not include facilities where conversion to sulfuric acid is utilized primarily as a means of preventing emissions to the atmosphere of sulfur dioxide or other sulfur compounds. The owner or operator of each sulfuric acid plant of greater than 200 tons per day production capacity, the production capacity being expressed as 100 percent acid, shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of sulfur dioxide which meets the appropriate performance specifications as specified in subsection (7) of this section for each sulfuric acid producing facility within such plant.

(c) Nitric acid plants. For the purposes of this regulation "nitric acid plant" means any facility producing nitric acid thirty (30) to seventy (70) percent by weight in strength by either the pressure or atmospheric pressure process. The owner or operator of each nitric acid plant of greater than 200 tons per day production capacity, the production capacity being expressed as 100 percent acid, shall install, calibrate, maintain and operate a continuous monitoring system for the measurement of nitrogen oxides which meet the appropriate specifications as specified in subsection (7) of this section for each nitric acid producing facility within such plant.

(d) Petroleum refineries. The owner or operator of each affected facility specified in this paragraph shall install, calibrate, maintain and operate continuous monitoring equipment as follows:

1. A continuous monitoring system for the measurement of opacity for catalyst regenerator for fluid bed cracking units of greater than 20,000 barrels per day fresh feed capacity which meets the appropriate performance specifications specified in subsection (7) of this section.

2. A continuous monitoring system for the measurement of sulfur dioxide in the gases discharged into the atmosphere from the combustion of fuel gases subject to 401 KAR 61:145 which meets the appropriate performance specifications specified in subsection (7) of this section (except where a continuous monitoring system for the measurement of hydrogen sulfide is installed under subparagraph 3 of this paragraph). The pollutant gas used to prepare calibration gas mixtures under Performance Specification 2 of 40 CFR 60 paragraph 2.1 and for calibration checks shall be sulfur dioxide. The span shall be set at 100 ppm. For conducting monitoring system performance evaluations, Reference Method 6 shall be used.

3. An instrument for continuously monitoring and recording concentrations of hydrogen sulfide in fuel gases burned in any fuel gas combustion device subject to 401 KAR 61:145 which meets the appropriate performance specifications specified in subsection (7) of this section, if compliance is achieved by removing hydrogen sulfide from the fuel gas before it is burned; fuel gas combustion devices having a common source of fuel gas may be monitored at one (1) location, if monitoring at this location accurately represents the concentration of hydrogen sulfide in the fuel gas burned. The span of this continuous monitoring system shall be 300 ppm.

4. An instrument for continuously monitoring and recording concentrations of sulfur dioxide in the gases discharged into the atmosphere from any Claus sulfur recovery plant subject to 401 KAR 61:145 which meets the appropriate performance specifications in subsection (7) of this section, if compliance is achieved through the use of an oxidation control system or a reduction control system followed by incineration. The span of this continuous monitoring system shall be set at 500 ppm.

5. An instrument(s) for continuously monitoring and recording the concentration of hydrogen sulfide and reduced sulfur compounds in the gases discharged into the atmosphere from any Claus sulfur recovery plant subject to 401 KAR 61:145 which meets the appropriate performance specifications specified in subsection (7) of this section, if compliance is achieved through the use of a reduction control system not followed by incineration. The span(s) of this continuous monitoring system shall be set at twenty (20) ppm for monitoring and recording the concentration of hydrogen sulfide and 600 ppm for monitoring and recording the concentration of reduced sulfur compounds.

6. An instrument for continuously monitoring and recording the concentration of sulfur dioxide in gases discharged into the atmosphere from fluid catalytic cracking unit catalyst regenerators subject to 401 KAR 61:145 which meets the appropriate performance specifications specified in subsection (7) of this section. The span of this continuous monitoring system shall be 1,500 ppm.

(e) Incinerators. Each incinerator with a charging capacity of more than forty-five (45) metric tons per day (fifty (50) tons/day) shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of opacity which meets the appropriate performance specifications as specified in subsection (7) of this section.

(f) Each control device with a concentrated discharge associated with the affected facilities subject to 401 KAR 61:075, or 401 KAR 61:080 shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of opacity which meets the appropriate performance specifications as specified in subsection (7) of this section.

(7) Except as provided in subsection (8) of this section, all owners or operators which are required to comply with this section shall demonstrate compliance with the following performance specifications of Appendix B to 40 CFR 60.

(a) Continuous monitoring systems for measuring opacity shall comply with Performance Specification 1.

(b) Continuous monitoring systems for measuring sulfur dioxide shall comply with Performance Specification 2.

(c) Continuous monitoring systems for measuring nitrogen oxides shall comply with Performance Specification 2.

(d) Continuous monitoring systems for measuring oxygen shall comply with Performance Specification 3.

(e) Continuous monitoring systems for measuring carbon dioxide shall comply with Performance Specification 3.

(8) An owner or operator who, prior to September 11, 1974, entered into a binding contractual obligation to purchase specific continuous monitoring system components or who installed continuous monitoring equipment prior to October 6, 1975 shall comply with the following requirements:

(a) Continuous monitoring systems for measuring opacity of emissions shall be capable of measuring emission levels within plus or minus twenty (20)percent with a confidence level of ninety-five (95) percent. The Calibration Error Test and associated calculation procedures set forth in Performance Specification 1 of Appendix B to 40 CFR 60 shall be used for demonstrating compliance with this specification;

(b) Continuous monitoring systems for measurement of nitrogen oxides or sulfur dioxide shall be capable of measuring emission levels within plus or minus twenty (20) percent with a confidence level of ninety-five (95) percent. The Calibration Error Test, the Field Test for Accuracy (Relative), and associated operating and calculation procedures set forth in Appendix B to 40 CFR 60 shall be used for demonstrating compliance with this specification.

(c) Owners or operators of all continuous monitoring systems installed on an affected facility prior to October 6, 1975, may be required to conduct tests under paragraphs (a) and/or (b) of this subsection if requested by the department.

(d) All continuous monitoring systems referenced by this subsection shall be upgraded or replaced (if necessary) with new continuous monitoring systems, and the new or improved systems shall be demonstrated to comply with applicable performance specifications

within five (5) years from June 29, 1979.

(9) Calibration gases. For sulfur dioxide monitoring systems installed on indirect heat exchangers, sulfuric acid plants or petroleum refinery fluid catalyst cracking unit regenerators, the pollutant gas used to prepare calibration gas mixtures (Section 2.1, Performance Specification 2, Appendix B to 40 CFR 60) shall be sulfur dioxide. For nitrogen oxides monitoring systems, installed on nitric oxide plants the pollutant gas used to prepare calibration gas mixtures (Section 2.1, Performance Specification 2, Appendix B to 40 CFR 60) shall be nitrogen oxide. This gas shall also be used for daily checks under subsection (13) of this section as applicable. Span and zero gases certified by their manufacturer to be traceable to National Bureau of Standards reference gases shall be used whenever these reference gases are available. Every six (6) months from dates from dates of manufacture, span and zero gases shall be reanalyzed by conducting triplicate analyses using the reference methods in Appendix A to 40 CFR 60 as follows: for sulfur dioxide, use Reference Method 6, for nitrogen dioxide use Reference Method 7, and for carbon dioxide and oxygen use Reference Method 3.

(10) Cycling times. Cycling times include the total time a monitoring system requires to sample, analyze, and record an emission measurement.

(a) Continuous monitoring systems for measuring opacity shall complete a minimum of one (1) cycle of operation (sampling, analyzing, and data recording) for each successive ten (10) second period.

(b) Continuous monitoring systems for measuring oxides of nitrogen, carbon dioxide, oxygen, or sulfur dioxide shall complete a minimum of one (1) cycle of operation (sampling, analyzing, and data recording) for each successive fifteen (15) minute period.

(11) Monitor location. A continuous monitoring device shall be installed such that representative measurements of emissions or process parameters (i.e., oxygen or carbon dioxide) from the affected facility are obtained. Additional guidance for location of continuous monitoring systems to obtain representative samples are contained in the applicable Performance Specifications of Appendix B of 40 CFR 60.

(12) Combined effluents. When the effluents from two (2) or more affected facilities of similar design and operating characteristics are combined before being released to the atmosphere, the department may allow monitoring systems to be installed on combined effluent. When the affected facilities are not of similar design and operating characteristics, or when the effluent from one (1) point, the department shall establish alternate procedures to implement the intent of these requirements.

(13) Zero and span drift. Owners or operators of all continuous monitoring systems installed in accordance with the requirements of this subsection shall record the zero and span drift in accordance with the method prescribed by the manufacturer of such instruments; to subject the instruments to the manufacturer's recommended adjustments at shorter intervals, in which case the recommendations shall be followed; to adjust the zero and span whenever the twenty-four (24) hour zero drift or twenty-four (214) hour calibration drift limits of the applicable performance specifications in Appendix B of 40 CFR 60 are exceeded; and to adjust continuous monitoring systems referenced by subsection (8) of this section whenever the twenty-four (24) hour zero drift or twenty-four (24) hour calibration drift exceeds ten (10) percent of the emission standard.

(14) Span. Instrument span should be approximately 200 percent of the expected instrument data display output corresponding to the emission standard of the source.

(15) Alternate procedures and requirements. The department may allow equivalent procedures and requirements that have been approved by the U.S. Environmental Protection Agency for continuous monitoring systems as follows:

(a) Alternate monitoring requirements to accommodate continuous monitoring systems that require corrections for stack moisture conditions (e.g., an instrument measuring sulfur dioxide emissions on a wet basis could be used with an instrument measuring oxygen concentration on a dry basis if acceptable methods of measuring stack moisture conditions are used to allow accurate adjustments of the measured sulfur dioxide concentrations to a dry basis).

(b) Alternate locations for installing continuous monitoring systems or monitoring devices when the owner or operator can demonstrate to the satisfaction of the department that installation at alternate locations will enable accurate and representative measurements.

(c) Alternative procedures for performing calibration checks (e.g., some instruments may demonstrate superior drift characteristics that require checking at less frequent intervals).

(d) Alternative monitoring requirements when the effluent from two (2) or more identical affected facilities is released to the atmosphere through more than one (1) point (e.g., an extractive, gaseous monitoring system used at several points may be approved if the procedures recommended are suitable for generating accurate emission averages).

(e) Alternate continuous monitoring systems that do not meet the spectral response requirements in Performance Specification 1, Appendix B of 40 CFR 60, but adequately demonstrate a definite and consistent relationship between their measurements and the opacity measurements of a system complying with the requirements in Performance Specification 1. The department may require that such demonstration be performed for each affected facility.

(16) Minimum data requirements. The following paragraphs set forth the minimum data reporting requirements. Both a printed summary and computer tape or cards shall be furnished in the format specified by the division.

(a) Owners or operators of facilities required install continuous monitoring systems shall submit for every calendar quarter, a written report of excess emissions and the nature and cause of the excess emissions if known. The averaging period used for data reporting should correspond to the averaging period specified in the emission test method used to determine compliance with an emission standard for the pollutant/source category in question. The required report shall include, as a minimum, the data stipulated in this subsection. All quarterly reports shall be postmarked by the thirtieth (30th) day following the end of each calendar quarter.

(b) For opacity measurements, the summary shall consist of the magnitude in actual percent opacity of six (6) minute averages of opacity greater than the opacity standard in the applicable standard for each hour of operation of the facility. Average vales may be obtained by integration over the averaging period or

by arithmetically averaging a minimum of four (4) equally spaced, instantaneous opacity measurements in excess of the standard, minus the two (2) minute exemption). If more than one (1) opacity standard applies, excess emissions data must be submitted in relation to all such standards. Opacity data need be reported on computer cards or tape only.

(c) For gaseous measurements the summary shall consist of hourly averages in the units of the applicable standard. The hourly averages shall not appear in the written summary, but shall be made available from the computer tape or cards.

(d) The date and time identifying each period during which the continuous monitoring system was inoperative, except for zero and span checks, and the nature of system repairs or adjustments shall be reported. Proof of continuous monitoring system performance whenever system repairs or adjustments have been made is required.

(e) When no excess emissions have occurred and the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be included in the report.

(f) Owners or operators of affected facilities shall maintain a file of all information reported in the quarterly summaries, and all other data collected either by the continuous monitoring system or as necessary to convert monitoring data to the units of the applicable standard for a minimum of two (2) years from the date of collection of such data or submission of such summaries.

(17) Owners or operators of affected facilities shall use the following procedures for converting monitoring data to units of the standard where necessary.

(a) For indirect heat exchangers the following procedures shall be used to convert gaseous emission monitoring data in parts per million to g/million cal (lb/million BTU) where necessary:

1. When the owner or operator of an indirect heat exchanger elects under subsection (6)(a)3 of this section to measure oxygen in the flue gases, the measurements of the pollutant concentration and oxygen concentration shall each be on a dry basis and Equation I of the conversion procedures in Appendix A to this regulation shall be used.

2. When the owner or operator elects under subsection(6)(a)3 of this section to measure carbon dioxide in the flue gases, the measurement of the pollutant concentration and the carbon dioxide concentration shall each be on a consistent basis (wet or dry) and Equation II of the conversion procedures in Appendix A to this regulation shall be used.

(b) For sulfuric acid plants the owner or operator shall:

1. Establish a conversion factor three (3) times daily according to the procedures in 401 KAR 59:035, Section 5(2);

2. Multiply the conversion factor by the average sulfur dioxide concentration in the flue gases to obtain average sulfur dioxide emissions in kg/metric ton (lb/short ton); and

3. Report the average sulfur dioxide emission for each averaging period in excess of the applicable emission standard in the quarterly summary.

(c) The department may allow data reporting or reduction procedures

varying from those set forth in this section if the owner or operator of a source shows to the satisfaction of the department that his procedures are at least as accurate as those in this section. Such procedures may include but are not limited to the following:

1. Alternative procedures for computing emission averages that do not require integration (e.g., some facilities may demonstrate that the variability of their emissions is sufficiently small to allow accurate reduction of data based upon computing averages from equally spaced data points over the averaging period).

2. Alternative methods of converting pollutant concentration measurements to the units of the emission standards.

(18) Special consideration. The department may provide for approval, on a case-by-case basis, of alternative monitoring requirements different from the provisions of this section if the provisions of this section (i.e., the installation of a continuous emission monitoring system) cannot be implemented by a source due to physical plant limitations or extreme economic reasons. In such cases, when the department exempts any source subject to this section by the use of this provision from installing continuous emission monitoring systems, the department shall set forth alternative emission monitoring and reporting requirements (e.g., periodic manual stack tests) to satisfy the intent of these regulations. Examples of such special cases include, but are not limited to, the following:

(a) Alternative monitoring requirements may be prescribed when installation of a continuous monitoring system or monitoring device specified by this section would not provide accurate determinations of emissions.

(b) Alternate monitoring requirements may be prescribed when the affected facility is infrequently operated.

(c) Alternative monitoring requirements may be prescribed when the department deems that the requirements of this section would impose an extreme economic burden on the source owner or operator. The burden of proof for an alleged "economic burden" is to be borne by the source.

(d) Alternative monitoring requirements may be prescribed when the department deems that monitoring systems prescribed by this section cannot be installed due to physical limitations at the facility.

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1st Revision	DEC 09, 1982	DEC 04, 1986	51 FR 43742
		MAY 04, 1986	54 FR 19169

APPENDIX A TO 401 KAR 61:005
CONVERSION PROCEDURES

Equation I. $E = \frac{CF\ (20.9)}{(20.9 - \%O_2)}$

Equation II. $E = \frac{C\ F_c\ (100)}{\%CO_2}$

E = pollutant emission, g/million cal (lb/million BTU).

C = pollutant concentration, g/dscm (lb/dscf), determined by multiplying the average concentration (ppm) for each hourly period by 4.16×10^{-5}M g/dscm per ppm (2.64×10^{-9}M lb/dscf per ppm)

where M = pollutant molecular weight, g/g-mole (lb/lb-mole).

M = 64 for sulfur dioxide and
46 for oxides of nitrogen.

$\%O_2$ = Oxygen volume (expressed as percent) determined with equipment specified under Section 3(6)(a)3.

$\%CO_2$ = carbon dioxide volume (expressed as percent) determined with equipment specified under Section 3(6)(a)3.

F, Fc = a factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted (F), and a factor representing a ratio of the volume of carbon dioxide generated to the calorific value of the fuel combusted (Fc) respectively. Values of F and Fc are given in 401 KAR 59:015 as applicable.